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The Wealth Effect in the Eurozone

Summary: The recent global financial crisis represents a serious threat to the growth of economies. This crisis deeply affects the real economy through a phenomenon known as the wealth effect, which assumes that a fall in wealth leads to a reduction of private consumption. Thus, this paper analyzes the wealth effect on consumption using quarterly macro-data for 10 Eurozone countries in the period 2000-2010. The results suggest the existence of a positive and significant wealth effect on consumption with the predominance of a financial effect on housing, showing larger consumption sensitivity to changes in the value of financial assets.

Key words: Wealth, Consumption, Crisis, Eurozone.

JEL: E21, G01, O52.

Recent literature (Carmen M. Reinhart and Kenneth S. Rogoff 2008; Jürgen Antony and Peter Broer 2010; Bank for International Settlements - BIS 2011) emphasizes the strong relationship between a financial crisis and the real economy. Several transmission channels can be identified connecting a financial crisis to the real economy. One of these channels is the wealth effect, which induces changes in consumption due to the perception of greater (or smaller) wealth of the households as a result of the asset price fluctuation. As such, the idea of greater (smaller) wealth of the households hypothetically induces them to increase (reduce) their levels of consumption affecting the demand function and, consequently, the GDP as well.

This paper aims to analyze the evolution of wealth in 10 Eurozone countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Portugal, Spain, and the Netherlands) and its effect on private consumption for the period 2000-2010. These countries have a wide experience in the Economic and Monetary Union and currently together produce more than 95% of the Eurozone GDP. The analysis takes into account both the financial and housing nature of the wealth effect.

Section 1 discusses the theoretical aspects related to the wealth effect. In Section 2, a methodology of estimating the wealth levels is suggested along with its evolution. In Section 3, we develop a quantitative approach using econometric analysis (panel data) to obtain a more precise measurement of the wealth effect as well as its impact in the recent context. Conclusions are drawn in Section 4.

1. Theoretical Background

Previous literature has established a positive association between wealth and private consumption. Theoretical models foresee that the unexpected shocks that affect the wealth modify the permanent family incomes, altering the pattern of saving and consumption throughout a lifetime. According to the lifetime hypothesis, developed by Richard Brumberg and Franco Modigliani (1954), the consumers try to moderate the pattern of consumption throughout life. In this context, consumption depends on permanent income, initial wealth, life expectancy, and intertemporal preference rate. Further studies (Modigliani and Ezio Tarantelli 1975; Walter J. Elliot 1980) extended the basic model to adjust the deflections of predictions, and obtained a more realistic interpretation of consumers' decisions.

Moreover, it is important to take into account the heterogeneous nature of wealth and that not all types of wealth produce the same effect on consumption. Economic theory suggests that the more liquid the asset is, the greater is the consumption response in face of an increase in the asset value. In addition, the larger the consumption response, the easier it is to measure the value of the asset. This response depends on whether the increase in the value of an asset is of short or long duration, since a long-run increase of this value enables households to increase their level of consumption with greater confidence. Therefore, it is not possible to assure that the financial wealth effect is greater than the housing effect, something to which this study aims to contribute from an empirical point of view.

In general, empirical literature finds evidence that shows a positive and significant long-run relationship between wealth and consumption. Carol C. Bertaut (2002) finds significant statistical evidence of financial wealth in two industrialized countries during the 1980s and 1990s, comparable with U.S. results. Bertaut uses OLS dynamic models of long-term consumption based on the procedure of "advances" and "delays" suggested by James H. Stock and Mark W. Watson (1993). Alexander Ludwig and Torsten Slok (2002) find a significant impact of financial and housing wealth on consumption with predominance of financial wealth for 16 OECD countries during the 1980s and 1990s. José M. Barata and Luís M. Pacheco (2003) examine the private consumption performance over the long-run as a function of disposable income and disaggregated wealth using quarterly data (1980-2001) of 6 European countries. Results suggest significant statistical evidence of wealth effect on consumption emphasizing the housing effect. Karl E. Case, John M. Quigley, and Robert J. Shiller (2005) provide a comparative analysis of the financial and housing wealth effects on consumption using a series of 14 countries' annual data (1975-1999) and another panel of U.S. quarterly data (1982-1999). Their results confirm a strong and statistically significant housing wealth effect on consumption.

Frauke Skudelny's study (2009) examines the wealth effect on consumption for 12 Eurozone countries using two quarterly databases with aggregated (1980-2006) and nonaggregated (1995-2006) data. Results suggest that the wealth impact on consumption is positive and significant in most models with the predominance of financial wealth. In the same vein, Jirka Slacalek (2009), using quarterly data (1970-2004) for 16 countries and a method based on the sluggishness of aggregate consumption growth initially proposed by Christopher D. Carroll, Misuzu Otsuka, and

Slacalek (2006), find that the housing wealth effects on consumption are a little smaller than the financial wealth in 9 of the 16 examined countries.

More recently, Christian Dreger and Hans-Heggert Reimers (2011) analyzed the long-run relationship between private consumption, disposable income, and price index as proxies of wealth levels for a panel of quarterly data of 15 industrialized countries during the period 1991-2010. They conclude that data concerning consumption, disposable income, and wealth are cointegrated in their common components. Second, they observe that the impact of housing price index exceeds the effects resulting from financial price index. Finally, the long-run vector is generally in line with the life cycle permanent-income hypothesis, if house prices are allowed to enter the relationship.

2. Estimation of Wealth Levels

From a methodological point of view, the technique of using price indexes as proxies for aggregated wealth levels constitutes the most common approach to measuring the effect of wealth on private consumption (Sydney Ludvigson and Charles Steindel 1999; Morris A. Davis and Michael G. Palumbo 2001; Ludwig and Slok 2002; Barata and Pacheco 2003; Dreger and Reimers 2011). The housing price index is an indicator that expresses the change in median housing price throughout time. Share price index is an indicator that expresses to what extent the price of stocks varies throughout time.

However, such indexes do not consider changes in wealth levels, which might lead to inconsistent results. It is important to point out that if by wealth we know the asset value, its price might be a key element in its evolution, although not exclusively. For this reason, we apply an alternative methodology for estimation of financial and housing wealth levels against the price index.

The methodology used for estimation of the financial and housing wealth levels is partially inspired in the procedure adopted in other studies (Case, Quigley, and Shiller 2005; Skudelny 2009; Slacalek 2009). As such, we estimated the value of the quarterly financial wealth per capita from the product of the net consolidated financial wealth (consolidated annual data of the households and nonprofit institutions of countries as a percentage of GDP) and the quarterly GDP per capita from the Eurostat in the period 2000-2010. The source of data (Eurostat 2014[1]) does not provide separate data for nonprofit institutions and households. However, it should be noted that households are the major player, as national accounting usually shows (e.g. the share of nonprofit institutions in GDP usually is below 5% of the joint share). Thus, it is not expected that this will have a distorting effect on the analysis. Since the net consolidated financial wealth (*FW*) is expressed as a percentage of GDP in the statistical source (OECD 2014[2]), this variable is multiplied by GDP per capita (*GDPpc*) to obtain a measure of the financial wealth per capita, as Equation (1) shows. The avail-

[1] **Eurostat.** 2014. Database by Themes. Economy and Finance. http://ec.europa.eu/eurostat/data/database (accessed January 11, 2015).
[2] **OECD.** 2014. OECD Statistics. National Accounts - Financial Accounts. http://stats.oecd.org (accessed January 08, 2014).

able quarterly data for financial wealth per capita is: i) Germany, Austria, Belgium, Spain, France, Greece, the Netherlands, and Portugal (2000Q1-2010Q4); ii) Italy (2000Q1-2009Q4); iii) Ireland (2001Q1-2010Q4).

$$FWpc_{it} = FW_{it} \, x \, GDPpc_{it}\,, \tag{1}$$

where $FWpc_{it}$ is the financial wealth per capita for the country i in the year t; FW_{it} is the net consolidated financial wealth of the households and nonprofit institutions serving households for the country i in the year t as a percentage of GDP; $GDPpc_{it}$ is the gross domestic product per capita for the country i in the year t.

Furthermore, we estimated the value of the housing wealth per capita for the period 2000-2010 (quarterly data) using Equation (2). In this regard, housing wealth (*HW*) was calculated taking into account four factors: a) average real housing price per square meter of a dwelling (expressed in Euros); b) stock of dwellings per capita; c) average size of a dwelling (expressed in square meters); d) home-ownership rate (%).

$$HWpc_{it} = P_{it} \, x \, DSpc_{it} \, x \, S_i \, x \, R_i, \tag{2}$$

where $HWpc_{it}$ is the real housing wealth per capita for the country i in the year t; P_{it} is the average real housing price per sqm for the country i in the year t; $DSpc_{it}$ is the dwelling stock per capita for the country i in the year t; S_i is the average size of housing unit for the country i; R_i is the home ownership rate for the country i.

The average real housing price, P_{it}, has been collected from the Global Property Guide for a certain country in a year t and its series reconstructed from the real housing price index. The data concerning the real housing price index simultaneously have been collected from the OECD for Austria, Belgium, France, Germany, Ireland, Italy, the Netherlands, and Spain; and from the Global Property Guide[3] for Greece and Portugal. Moreover, dwelling stock per capita, $DSpc_{it}$, has been calculated using the data gathered from the bulletin published by the United Nations[4] and its series reconstructed through a procedure of linear interpolation. Lack of information made it impossible to calculate the dwelling stock for Italy. The data concerning the average size of housing unit, S_i, have been obtained from the study of Carme Trilha (2001), assuming the average size is stable in time. Finally, the home-ownership rate, R_i, has been collected from the publication of the European Central Bank (ECB 2009), assuming it is stable in the period. As a result, the available quarterly data for real housing wealth per capita is: 1) Germany, Austria, Belgium, Spain, France, Greece, the Netherlands, and Ireland (2000Q1-2010Q4); 2) Portugal (2001Q3-2010Q4); 3) Italy: not available.

Some particularities of this study should be highlighted in comparison with others. First, we use a methodology to estimate financial wealth that differs from others (e.g. Case, Quigley, and Shiller 2005 estimate the aggregate stock market wealth). Second, this study focuses on the period 2000-2010 that ends with the recent global crisis, whereas many other works examine an earlier period (e.g. Case, Quig-

[3] **Global Property Guide.** 2014. Residential Property Investment Research. http://www.globalpropertyguide.com (accessed January 15, 2014).

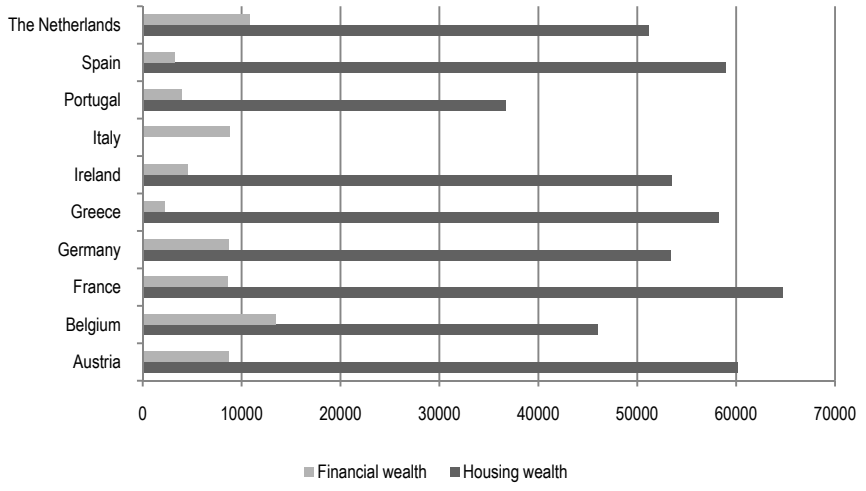
[4] **United Nations Economic Commission for Europe (UNECE).** 2014. Bulletin - Housing and Land Management - 2006. http://www.unece.org/hlm/prgm/hsstat/Bulletin_06.html (accessed January 08, 2014).

ley, and Shiller 2005 examine the period 1975-1999 with annual data for 14 countries and the period 1982-1999 with quarterly data for U.S.). Third, we focus on Eurozone countries, where the institutional framework is more homogeneous (EMU policy framework) than in many other studies (e.g. Bertaut 2002; Case, Quigley, and Shiller 2005; Slacalek 2009; Dreger and Reimers 2011). This consideration introduces an additional attention in the analysis through the comparison among countries within a similar institutional framework. Fourth, while many works use annual data for international comparisons, we use quarterly data.

3. Results and Discussion

3.1 Level and Evolution of Wealth in the Eurozone Countries: A Comparative Analysis

In general, our estimates show that the housing wealth level is quite larger than the net financial wealth level in the period (Figure 1). Comparatively, the growth of housing wealth has been superior to the financial wealth in the last decade primarily due to the rise in housing prices. The disparity between the wealth levels could be explained because the housing wealth values do not contemplate the originating debt of mortgages, an amount that would certainly reduce the value of liquid housing wealth. In this way, this mortgage debt that should, in principle, be taken from the amount of housing wealth is transferred to financial wealth, considering that the liquid value calculated excludes the household debts, where the mortgage debts are included.



Note: The average values of Italy's financial wealth refer to 2009; data not available for Italy's housing wealth.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).

Figure 1 Financial and Housing Wealth Levels (Average Values in Euros Per Capita for 2010)

Table 1 shows data of financial and housing wealth cumulative growth rate in three different periods (2000-2007, 2008-2010, 2000-2010). As shown, the evolution of different kinds of wealth suggests a heterogeneous performance between countries.

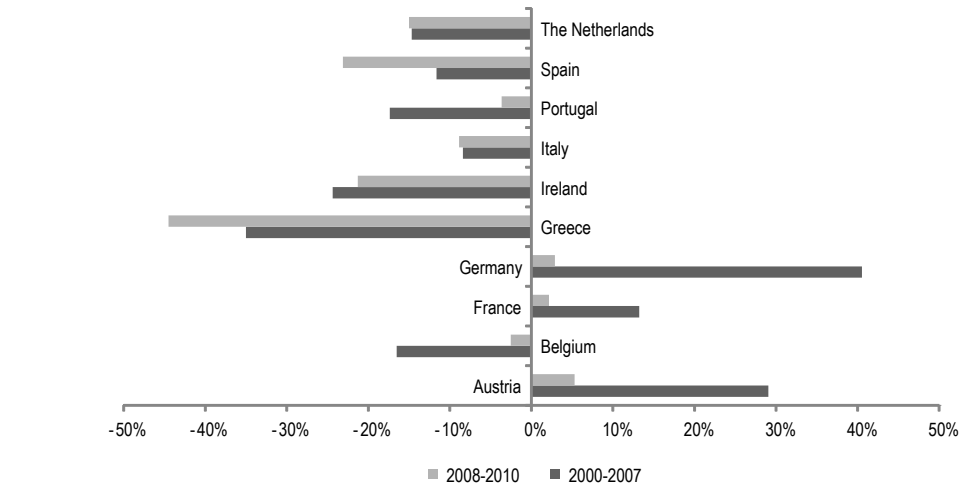
Table 1 Financial and Housing Wealth Cumulative Growth Rate

	Financial wealth per capita (***FWpc***) (%)			Housing wealth per capita (***HWpc***) (%)		
	2000-2007	2008-2010	2000-2010	2000-2007	2008-2010	2000-2010
Austria	29.1	5.3	35.9	83.8	11.5	104.9
Belgium	-16.5	-2.5	-18.6	59.6	1.9	62.7
France	13.2	2.2	15.7	96.4	0.9	98.2
Germany	40.5	2.9	44.6	-9.5	2.4	-7.3
Greece	-35.0	-44.5	-63.9	60.1	-17.2	32.6
Ireland	-24.4	-21.3	-40.5	54.0	-29.2	9.0
Italy	-8.4	-8.9	-16.5	NA	NA	NA
Portugal	-17.4	-3.7	-20.4	2.9	-8.1	-5.4
Spain	-11.6	-23.1	-32.1	89.3	-17.7	55.7
The Netherlands	-14.7	-15.0	-27.5	29.7	-6.6	21.2
Average	-4.5	-8.2	-12.3	51.8	-6.9	41.3

Note: NA not available.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).

Regarding the financial wealth, the period 2000-2007 is characterized by a quite modest growth in the wealth level (Table 1 and Figure 2). However, the higher growth of financial wealth in France (13.2%), Austria (29.1%), and Germany (40.5%) is remarkable, when compared with the average growth (-4.5%) and the

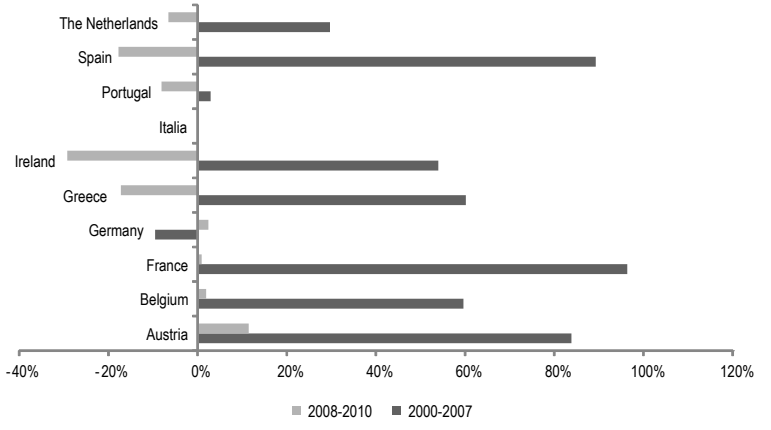


Source: Authors' own elaboration with data from Eurostat (2014).

Figure 2 Percent Changes in Financial Wealth Per Capita

weak performance of other countries (e.g. Portugal, Ireland, and Greece). The technology company crisis and the financial crisis seem to have played a major role in the weak performance of global financial market, negatively affecting the evolution of wealth value in certain countries (Figure 2). France (2.2%), Germany (2.9%), and Austria (5.3%) are the only countries that have not seen the financial wealth level reduced during the period of crisis (2008-2010). The opposite occurs in Ireland (-21.3%), Spain (-23.1%), and especially Greece (-44.5%), which presented a significant reduction of financial wealth level in the recession period.

Concerning the housing wealth evolution, the period 2000-2007 shows a great growth, especially for the case of Austria (83.8%), Spain (89.3%), and France (96.4%). During the period of crisis (2008-2010), the fall of housing wealth is very significant in Greece (-17.2%), Spain (-17.7%), and Ireland (-29.2%), countries strongly affected by the collapse of the construction sector (Table 1 and Figure 3). The high unemployment rate, associated with the high level of household indebtedness, have contributed to the reduction of housing demand, causing an intense fall in housing price in these countries. In contrast, Belgium (1.9%), Germany (2.4%), and mainly Austria (11.5%) present no reduction in the housing wealth value in the period of crisis.



Note: No available data for Italy.

Source: Authors' own elaboration with data from Global Property Guide (2014) and OECD (2014).

Figure 3 Percent Changes in Housing Wealth Per Capita

It should be taken into account that, behind this evolution, there are important differences among the countries, in terms of over-construction and over-lending (see e.g. the high increases of real housing price index in Spain and France versus the stagnation of prices in Germany that lead to significant disparities regarding the changes in housing wealth). In this regard, the fall of the housing wealth during the period of crisis (2008-2010) was larger in countries with higher growth of housing wealth in the run-up to the crisis. The cases of Spain, Greece, Ireland, and Portugal show the common characteristic of a sharp drop in housing market (Table 1 and Figure 3). Moreover, it should also be noted that this fall of housing wealth derives from

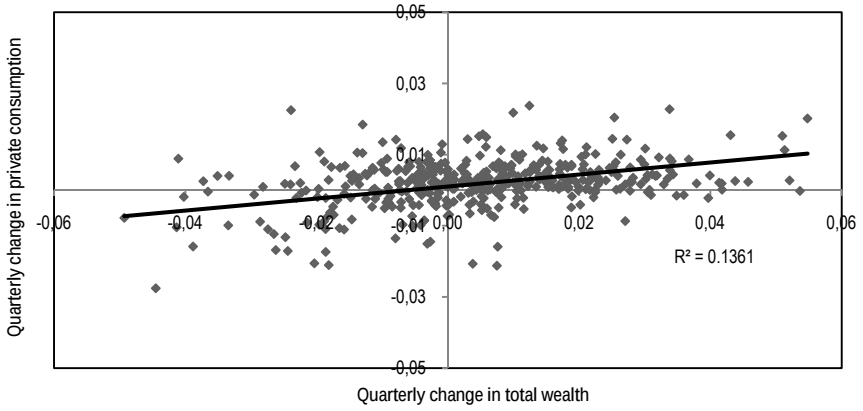
the credit restrictions and the increase of unemployment that have great impact on housing demand. As regards the Netherlands, the country has substantially delayed the implementation of adjustment measures. In 2011, with the euro crisis in full swing, the average new mortgage in the Netherlands was 112% of the property's value (The Economist 2014).

However, one critical reason that could explain the nonreduction of housing price in other countries is the maintenance of unemployment rate that reduces the uncertainty and holds housing demand in these countries. Moreover, the mortgage credit, another key factor in the housing price behavior, was less reduced in Germany, Belgium, and Austria than in other countries.

Additionally, we analyze the co-evolution of wealth and private consumption in changes and in levels, to obtain an outlook on the wealth effect impact at an aggregated level. The data used are collected from OECD and Global Property Guide databases and they refer to changes in quarterly private consumption per capita (*PCpc*) and changes in financial (*FWpc*), housing (*HWpc*), and total (*TWpc*) wealth per capita for the sample of countries. The total wealth per capita (*TWpc*) is calculated by summing the levels of financial wealth (*FWpc*) and housing wealth (*HWpc*) per capita.

The quarterly change corresponds to logarithmic rate of change. The values relative to *FWpc* have been estimated using data from Eurostat, whereas the series relative to *HWpc* and *TWpc* has been calculated with data from diverse statistical sources. The available quarterly data for changes in *TWpc* is: i) Germany, Austria, Belgium, Spain, France, Greece, the Netherlands (2000Q2-2010Q4); ii) Ireland (2001Q2-2010Q4); iii) Italy (2000Q2-2009Q4); iv) Portugal (2001Q4-2010Q4). Owing to lack of data, the changes in *TWpc* for Italy are assumed to be equal to the changes in *FWpc*. Data concerning the changes in *PCpc* are collected from Eurostat. As the first empirical evidence, a positive relationship between the growth rate (quarterly change) of total wealth and the growth rate (quarterly change) of consumption is observed (Figure 4).

Furthermore, Table 2 presents the correlation coefficients between the changes in private consumption and changes in financial (*FWpc*), housing (*HWpc*), and total (*TWpc*) wealth per capita for the sample of countries in the period 2000-2010. The correlation coefficients are significant at 0.05 level (two-tailed) in most of the cases, but some exceptions were found (Germany is the main exception here). Concerning the financial wealth (*FWpc*), the exception (nonsignificant coefficient) extends to Greece, Ireland, and Netherlands. The exceptions with regard to housing wealth (*HWpc*) extend to Austria, Belgium, and Portugal. At an aggregated level, a positive correlation is observed for total wealth as well as for financial and housing wealth. At a disaggregated level, a positive correlation in the case of total wealth in almost all countries is noted, except in Austria. In terms of financial wealth, a positive correlation in almost all countries is found, except in the Netherlands. Similarly, the same positive correlation is noted for the case of housing wealth, with the exception of Austria. Additionally, a predominance of housing wealth over financial wealth in 6 (Germany, Spain, France, Greece, the Netherlands, and Ireland) of the 10 countries is found.



Note: Logarithmic rate of change.

Source: Authors' own elaboration with data from Global Property Guide (2014) and OECD (2014).

Figure 4 Aggregated Quarterly Analysis, 2000-2010 (Quarterly Changes in Private Consumption and Total Wealth Per Capita)

Table 2 Correlations [(a)] between the Change in the Private Consumption Per Capita and the Change in Wealth and Unemployment

		Period 2000-2010			
		TWpc	***FWpc***	***HWpc***	***UNEM***
GLOBAL	Correl.	0.37***	0.12**	0.35***	-0.40***
	p-value	0.000	0.011	0.000	0.000
Austria	Correl.	-0.10	0.37***	-0.16	0.05
	p-value	0.509	0.013	0.319	0.735
Belgium	Correl.	0.33**	0.32**	0.19	-0.13
	p-value	0.033	0.038	0.211	0.395
France	Correl.	0.47***	0.37**	0.45***	-0.17
	p-value	0.002	0.013	0.003	0.266
Germany	Correl.	0.15	0.05	0.15	-0.12
	p-value	0.322	0.745	0.342	0.442
Greece	Correl.	0.60***	0.15	0.59***	-0.63***
	p-value	0.000	0.333	0.000	0.000
Ireland	Correl.	0.34**	0.02	0.37**	-0.57***
	p-value	0.032	0.882	0.013	0.000
Italy	Correl.	0.54***	0.54***	NA	-0.37**
	p-value	0.000	0.000	-	0.016
Portugal	Correl.	0.10	0.53***	0.07	-0.26*
	p-value	0.540	0.000	0.675	0.089
Spain	Correl.	0.56***	0.47***	0.53***	-0.74***
	p-value	0.000	0.002	0.000	0.000
The Netherlands	Correl.	0.22	-0.11	0.31**	-0.23
	p-value	0.148	0.472	0.045	0.132

[(a)] Pearson correlation coefficients.

Note: *TWpc* - total wealth per capita, *FWpc* - financial wealth per capita, *HWpc* - housing wealth per capita, *UNEM* - unemployment rate, NA - not available data. *, **, *** denote statistical significance at 10%, 5%, and 1% level, respectively (two-tailed).

Source: Authors' own elaboration with data from Global Property Guide (2014) and OECD (2014).

A different pattern is observed regarding the correlation between consumption and unemployment rate that is negative in most of the countries. In this case, the correlation coefficient is negative and significant in the Mediterranean countries (Greece, Italy, Portugal, and Spain) together with Ireland; these countries exhibit a high level of unemployment in the European context. However, it is not significant for the rest of the countries, as they show a lower level of unemployment.

A negative correlation is also found between the change in the consumption and the change in the unemployment rate both at global and particular point of view. In the case of Ireland, Greece, and Spain, the inverse relationship between the change in the consumption and the change in the unemployment rate is significant for the period under review. This relation might be explained by high oscillations of the unemployment rate in these countries as a result of the global crisis. Following the contribution of Kosta Josifidis, Alpar Lošonc, and Novica Supić (2010), we can say that the problems faced by these economies are not the usual of a cyclical downturn. In the particular case of Spain, the financial crisis caused a very strong shock on economic activity and employment (Francisco Carballo-Cruz 2011).

3.2 The Wealth Effect: Results of the Econometric Approach

To develop a more accurate approach of the wealth effect, we suggest an econometric estimation that includes variables that should explain the private consumption behavior according to the theoretical framework. Estimations are based on a panel data set with a structure that combines 10 units of cross-sections (countries) and 44 units of time series (quarterly data for the period 2000-2010).

These variables, expressed in logarithms and in per capita terms, are considered in changes and in levels (in logs). In this regard, we establish two econometric model specifications. The first specification (Table 3) referred to as levels (in logs) aims to find evidence about the narrow relationship between the explanatory variables (income, wealth, unemployment, etc.) and the level of consumption per capita. For the second specification (Table 4), referred to as changes, we attempt to verify the degree of relationship between the changes in these variables and the consumption per capita. In addition to other particularities mentioned above, it should be noted that the specification of this model includes variables such as unemployment rate, income inequality, and crisis dummy that are not included in other works.

The consumption per capita appears as the dependent variable, or expressed in levels (quarterly values in logs) or in changes (quarterly logarithmic change), depending on the specification. In relation to the explanatory variables, we consider other factors suggested by the literature, such as the disposable income per capita (with a presumed positive influence on consumption), the unemployment rate (with a supposed negative influence), or the level of inequality in the income distribution (with a supposed negative effect). Previous research emphasizes a negative effect of the income inequality on the aggregate demand, leading to increasingly large segments of formerly middle-class consumers unable to buy as many luxury and essential goods and services (David Castells-Quintana and Vicente Royuela 2012; Bruce D. Meyer and James X. Sullivan 2013). In this regard, the propensity to consume decreases with income, and thus at the macro level, we expect that consumption will

decrease with inequality. Moreover, income inequality could increase social tensions, increase the risk of investment, and reduce the private saving rate (Alberto Alesina and Roberto Perotti 1996).

Finally, the analysis includes a time dummy (*CRISIS*) that is 1 for the period 2008-2010 and 0 for the period 2000-2007. This variable is used to estimate the impact of the global crisis (period 2008-2010) on private consumption. On the one hand, this variable refers to the impact on consumption attributable to the economic, social, and political context change, which leads to the global crisis. A deterioration of expectations and an increase in uncertainty followed by restrictions on credit supply are considered in this variable. Therefore, with this variable, we explain the effects of others on consumption more precisely. On the other hand, this dummy might also be considered as a particular way of considering time fixed effects. Anyhow, we have also tested and estimated year fixed effects to control the effects of some trends more accurately. In this respect, we have created and used year dummies. This method required to replace the former time dummy (*CRISIS*) with year dummies to address multicollinearity. We found similar results using year fixed effects (see Tables 5 and 6 in Appendix for details). Thus, we use the time dummy (*CRISIS*) in the general specification, since this variable contributes to a better understanding of the effects of the economic crisis on private consumption.

For each specification (in changes and in levels), we present two models based on the degree of disaggregation of wealth variable. In this regard, we use models I and IV to estimate the total wealth effect, whereas models II and V are used to separately analyze the financial wealth effect and the housing wealth effect. In other words, models II and V examine the wealth effect taken into account so that the diverse nature of wealth might have different effects on consumption, as the empirical literature shows.

Concerning the explanatory variables, the household disposable income is considered first to capture the income effect on consumption. Second, the wealth level is considered presented both in total and disaggregated terms in its two components: financial and housing. Third, the unemployment rate is also included.

Unemployment causes a loss of income and a worsening of expectations leading to a reduction in consumption, not only of the unemployed and families (loss of income) but also in the rest of individuals and families (increase of savings what also leads to a reduction in consumption). We call this set of consequences on consumption the "unemployment effect". The fourth variable refers to the income-distribution inequality (approximated by the GINI index). GINI index is not included in models IV and V owing to statistical limitations. With this variable, we examine to what extent the income-distribution inequality affects consumption. Finally, the crisis dummy is included to capture the role of the recent crisis, as mentioned above.

It should be noted here that the models mentioned above only include estimates for individual effects of variables and thus it does not allow for examining the possible interactions among them. Because of this reason, it could be interesting to interact the time dummy (*CRISIS*) with the financial wealth and housing wealth variables. The context of crisis generates bad expectations about the evolution of asset prices and this could induce households to adjust their consumption anticipating

possible declining of financial and housing wealth. This might be considered as a conditioned wealth effect. In this regard, we have included two additional variables called "CriFinancial" and "CriHousing" that are calculated by multiplying the time dummy by the finance wealth variable and the housing wealth variable, respectively. Thus, we added models III and VI, in which individual variables are replaced with these two variables of interaction.

The empirical evidence has shown that both consumption and household asset portfolios can be influenced by changes in different variables such as interest rate (Robert E. Hall 1988; Hermann-Josef Hansen 1996; Mudit Kapoor and Shamika Ravi 2009), debt rate (e.g. Scott R. Baker 2013; Philip Bunn and May Rostom 2014), inflation rate, or valuation ratios such as price-to-earnings ratio (e.g. Guglielmo Maria Caporale and Ricardo M. Souza 2011). Moreover, several factors (market inefficiencies, changes in risk aversion, and changes in the joint distribution of consumption and asset returns) might explain why expected excess asset returns fluctuate with the business cycle (George M. Constantinides 1990; Eugene F. Fama 1998; Gregory R. Duffee 2005; Caporale and Souza 2011). These factors together with different types of economic behavior might eventually explain transitory deviations from the general trends in macroeconomic indicators such as consumption, income, and wealth. For example, if there is an expectation of future stock returns to be higher, households could increase their consumption in excess of its common trend. However, expectations of higher housing returns will have a different effect on consumption depending on whether housing assets are considered complementary (positive effect) or substitute (negative effect) for financial assets (Caporale and Souza 2011). Likewise, variables such as interest rate, indebted rate, or inflation rate might explain divergences of consumption and wealth from their common trends. The household's consumption also might be influenced by their level of indebtedness as it is a factor that limits their expenditure possibilities (e.g. Baker 2013; Bunn and Rostom 2014). Furthermore, highly indebted households may be more sensitive to income fluctuations than low-debt households. Additionally, households have an aversion to hold an indebted rate above their indebted target; thus, they might adjust consumption to maintain a target ratio of debt to income or assets (Baker 2013).

Concerning interest rate, the effect of this variable on consumption is a central issue in macroeconomics. Many studies coincide in showing that interest rates have small effects on consumption and saving (e.g. Hall 1988). However, the relationship between interest rate and consumption is far from being clear. The literature has recognized certain ambiguity due to endogeneity of interest rate (Hall 1988; Béla A. Balassa 1989) or due to methodological issues dealing with measurement of this relationship (Frederic S. Mishkin 1995). Hansen (1996) found that interest rates in Germany (both in nominal and in real terms) are stationary variables, whereas private consumption follows a stochastic trend. Thus, interest rates might influence only the short-run dynamics of consumption while the long-term trend of private consumption would be determined by other variables (Hansen 1996). Other studies (e.g. Kapoor and Ravi 2009) showed a negative and significant effect of interest rate on consumption. In short, higher interest rates might explain a drop in consumption through two ways: because of the credit crunch (more expensive credit) and because of higher financial returns.

According to the above considerations, a control for excesses in the financial or housing markets should be taken into account. In this regard, the analysis includes interest rate (money market interest rates, 3-month rates, Eurostat) as control variable.

It should be noted that there are several differences from previous studies. First, the estimation method concerning housing wealth is different from others. In particular, the method used in this study is based on the combination of different variables (average prices, stock of dwellings, average size of dwellings, home-ownership rate). Most of the previous research has been focused on the use of the price index of dwellings that is used as a proxy for housing wealth. However, this study goes one step further on this because we also consider the stock of dwellings per capita, the average size of dwellings, and the home ownership rate. We think that these additional factors allow us to approach a more realistic measure of housing wealth. Second, many works use a different methodology to estimate the financial wealth that focuses on the aggregate stock market wealth. This paper, however, estimates financial wealth per capita using net consolidated financial wealth data (expressed as a percentage of GDP). Third, we include some other variables (unemployment rate, income inequality, crisis dummy) that are not included in many other works.

Moreover, there are minor but interesting differences such as the period of analysis. In this respect, this study focuses on the period 2000-2010 that includes the emergence of the recent crisis. In addition, this study focuses on Eurozone countries, where the institutional framework is less heterogeneous than in other works. Thus, this analysis introduces an additional interest through the comparison among countries with related institutional contexts.

This study is carried out under a homogeneous framework context determined by the Economic and Monetary Union. However, to allow for country-specific institutional features, we use the fixed effects method (fixed effects by country), allowing more consistent estimations than the OLS procedure. In all panel regressions, we use clustered standard errors.

In the first specification, we obtained the results shown in Table 3. The inclusion of lagged consumption per capita (1 quarter) allows us to check the presence of cumulative levels of present consumption with respect to previous consumption. At the same time, it makes us consider the impact that the explanatory variables have on current consumption, since it reveals the existence of a multiplier effect throughout time.

The results demonstrate the close relationship between the level of consumption and household disposable income. This variable appears in models I and II with a quite high coefficient and a high level of significance. On the other hand, the consideration of the total wealth value is also significant, although with a coefficient and significance level less than the income. This result seems to be coherent with the hypothesis that the income (current income) presents a more direct influence on the consumption than the wealth (generally less liquidity than income).

In short, the results show that an increase of 10% in the total wealth elevates the consumption by 0.8%, whereas the same increase in the disposable income generates an increase of 5.5%. In any case, the dynamic nature of the relationship must be considered, which implies that an important part of the influence extends over time through a multiplying effect. Thus, we can estimate this impact through calculation

of the total multiplier. In this regard, we assumed a dynamic multiplier to measure the long-run effect of wealth on consumption. In particular, we use the total multiplier (also known as "Long-Run Multiplier" or "Long-Run Propensity") that indicates the long-run change in a variable (e.g. consumption) as a response of a unit change in the other variable (e.g. wealth). Actually, the use of this multiplier is a standard tool of dynamic models, which include lags distribution. In short, this multiplier is calculated by the sum of all effects over time. In algebraic notation, the total multiplier, m_T, is calculated by adding all the partial multipliers, m_j, "j" being the lag from the outset onwards: $m_T = \sum_{j=0}^{\infty} m_j$ (for details on long-run multiplier and cumulative effect, see e.g. Jeffrey Wooldridge 2012, Chapter 10). By calculating the total multiplier, we are assuming that there is an implicit dependence of the lagged dependent variables over time. Thus, the expected long-run effect will be larger than in just one time step. In other words: the long-run effect is the cumulative effect after all changes have taken place. In this case, the results show that an increase of 10% in the total wealth value reaches an impact of around 1% on consumption, which brings us close to the real magnitude of the wealth impact throughout time.

The division of the total wealth in its two components (model II) provides a different result, showing a positive and significant influence of the financial wealth on the consumption and a positive but no significant effect of housing wealth. This difference may be explained by the different degree of liquidity of the financial assets over the housing ones, as well as the ease of measurement.

On the other hand, the result concerning housing wealth can be explained by the combined action of two factors that act in different directions. First, there is a positive stimulus on consumption due to the value of housing assets that increases the borrowing capacity of households. Second, the lower degree of liquidity of the housing wealth should be taken into account by comparing it with the financial assets (stocks, bond, etc.). In fact, this feature restricts its impact on consumption, especially as it reduces the credit supply, which had been supported until 2007 in a visible unstoppable bubble of growth in house prices. Concerning this, Philip Arestis and Ana R. González (2014) develop a theoretical framework that confirms the endogenous nature of the bank credit to the private sector. In their model, the demand for credit is related to the demand for housing and the role that monetary authorities have to play is really important since credit markets are not "perfect" and borrowers are not "rational agents".

The inclusion of the unemployment rate highlights the relevance of the unemployment effect on consumption, showing a negative influence and being statistically significant. This effect, as indicated, is evidenced by the drop in household incomes and increased uncertainty with the worsening of expectations.

Another variable that keeps a negative influence on consumption, even though it does not reach a sufficient degree of statistical significance, is the level of income inequality (GINI). This result is coherent with the hypothesis that inequality is associated with lower consumption due to the regressive nature of the propensity of individuals to consume as income level increases.

Concerning the variables of interaction (CriFinancial and CriHousing), results are reported in model III (Table 3). Our findings suggest that both types of wealth variables interact with the crisis variable (time dummy), with this interaction being statistically significant. However, regarding the direction of the effect on private consumption, the interaction differs from one variable to another, being positive for Cri-

Financial and negative for CriHousing. A possible reason why we found a negative effect for CriHousing is that households are anticipating during the crisis possible relapses of house prices based on bad expectations.

Table 3 Panel Data Estimate (Fixed Effects by Country); Variables in Levels (in Logs); 10 Eurozone Countries; Period 2000-2010; Dependent Variable: Private Consumption Per Capita

	Model I	Model II	Model III
Constant	0.262*** (0.097)	0.021 (0.160)	0.041 (0.071)
Consumption per capita (q-1)	0.906*** (0.021)	0.944*** (0.020)	0.950*** (0.021)
Disposable income per capita	0.055*** (0.013)	0.042*** (0.010)	0.045*** (0.017)
Total wealth per capita (q-1)	0.008** (0.004)	------	------
Financial wealth per capita (q-1)	------	0.016*** (0.004)	------
Housing wealth per capita (q-1)	------	0.002 (0.004)	------
Unemployment rate	-0.011*** (0.003)	-0.008*** (0.003)	−0.003 (0.005)
Income inequality (GINI)	-0.011 (0.010)	-0.023** (0.011)	−0.004 (0.011)
Crisis (dummy, 2008-2010)	-0.005*** (0.001)	-0.004*** (0.001)	------
CriFinancial	------	------	0.006*** (0.002)
CriHousing	------	------	−0.006*** (0.002)
Interest rate	-0.001** (0.000)	-0.001*** (0.000)	−0.001** (0.000)
R-squared	0.999	0.999	0.999
Within R-squared	0.979	0.981	0.980
p-value (*F*-test)	0.000	0.000	0.000
Nº observations	332	301	334

Note: The variables refer to quarterly values and are expressed in logarithms. In all panel regressions, we use clustered standard errors. Robust standard errors are in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).

Nevertheless, the above specification, based on dynamic models, does not express the full essence of the wealth effect. This phenomenon is a process that takes place in time. Thus, this suggests the development of other approaches that capture this dynamic character, giving opportunity to the second specification that considers the changes in the variables.

To carry out this second specification, models IV, III, and VI have been considered (Table 4). In these panel regressions, we also use clustered standard errors. These models incorporate the quarterly change in the consumption per capita as the dependent variable and the quarterly change in the disposable income per capita, the quarterly change in the (total and disaggregated) wealth per capita, and quarterly change in the unemployment rate as the explanatory variables. In addition, the variable *dummy* is included to control the effect of crisis. Considering the existence of delay about the wealth effect on consumption, we include a delay of a quarter for the changes in the wealth per capita. Furthermore, model VI includes the variables of interaction.

Table 4 presents the results of panel data estimation by fixed effects (by country). These results are coherent with the wealth effect hypothesis for the 10 countries. Although the quality of the adjusted R-squared is sensibly lower than the one based on levels (in logs) (Table 4), this second specification implies a greater emphasis in the relations. It should be noted that the dependent variable can be affected by any number of factors that lead to consumption patterns that do not vary automatically. As such, we should note that the results of other studies including as the dependent variable the change in the private consumption per capita (Barata and Pacheco 2003; Case, Quigley, and Shiller 2005; Skudelny 2009) do not reach a higher-quality setting. Concerning the variables of interaction (model VI), results suggest again that both types of wealth variables interact with the crisis variable (time dummy), but here the interaction is statistically significant for the CriFinancial variable but not for CriHousing.

The results show the predominance of a positive and statistically significant wealth effect in all cases (models III and IV). In addition, this wealth effect seems to have been superior to the income effect, which shows the particular impact that changes in the wealth level have on consumer expectations of households.

Similar to the first specification, the results point to a predominance of the financial wealth effect and reveal a greater sensitivity of consumption to the effect of changes in the value of financial assets. The consumption of households was pushed by the positive expectations based on the value of their housing assets prior to the recent crisis, under a context of increasing credit supply. However, the decreasing liquidity of housing in comparison with financial assets might be a reason to explain this behavior. In general, an increase of 10% in the change in the total wealth elevates the change rate of consumption by 6.5%, whereas the same increase in the change in the disposable income generates an increase of 2.6% on consumption.

These results also highlight the explanatory relevance of the unemployment that shows a negative and significant effect on the change in the consumption. Finally, the dummy variable (*CRISIS*) shows a negative and significant effect on the changes in the consumption. As mentioned, the inclusion of this variable allows control of the role played by the context change in association with the recent crisis.

Table 4 Panel Data Estimate (Fixed Effects by Country); Variables in Changes; 10 Eurozone Countries; Period 2000-2010; Dependent Variable: Quarterly Change in Private Consumption Per Capita

	Model IV	Model V	Model VI
Constant	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Quarterly change in the disposable income per capita	0.026* (0.014)	0.0198* (0.012)	0.023 (0.015)
Quarterly change in the total wealth per capita (q-1)	0.065*** (0.018)	-----	-----
Quarterly change in the financial wealth per capita (q-1)	-----	0.0545*** (0.007)	-----
Quarterly change in the housing wealth per capita (q-1)	-----	0.036** (0.016)	-----
Quarterly change in the unemployment rate	-0.053*** (0.016)	-0.047*** (0.015)	−0.041*** (0.013)
Crisis (variable dummy, 2008-2010)	-0.003*** (0.001)	-0.003*** (0.001)	-----
Quarterly change in the CriFinancial			0.087*** (0.009)
Quarterly change in the CriHousing			0.090 (0.071)
Interest rate	0.001 (0.003)	0.002 (0.004)	0.005 (0.003)
R-squared	0.278	0.306	0.288
Within R-squared	0.260	0.293	0.275
p-value (*F*-test)	0.000	0.000	0.000
Durbin-Watson	2.08	2.02	2.01
Nº observations	407	368	418

Note: The quarterly changes refer to logarithmic rate of change. In all panel regressions, we use clustered standard errors. Robust standard errors are in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).

Finally, a number of falsification tests were done to examine if our estimates might be confounded by unobserved factors. It should be taken into account that falsification analysis is not addressed to validate the associations identified in empirical studies, but it is an interesting tool for interpreting results with caution. In short, these falsification tests are based on the false hypothesis that randomness would explain the effect of wealth on consumption. To implement this test, we take the quarterly values of wealth (in logs) randomly sorted within groups (countries). In other words: we changed the order of the observations within countries following a random

criterion. In this regard, if the effect captured by wealth variables in estimates were not causal, then we would expect the coefficients of these transformed (randomly sorted data) variables on consumption to be as large and significant as that in the actual sequence of values. Results of these (falsification) tests show that coefficients of wealth variables are not significant and they are smaller than coefficients in the estimate with the correct chronology for wealth; thus, the false hypothesis is not confirmed (see Tables 7 and 8 in Appendix for details). Thus, this finding suggests that wealth effect is specific to the time in which wealth is present.

4. Conclusion

We analyze the wealth effect on consumption using quarterly macro-data for 10 Eurozone countries: Austria, Belgium, France, Germany, Greece, Ireland, Italy, Portugal, Spain, and the Netherlands. This effect means that changes of wealth levels influence the changes in the consumption. To do this, we have developed a methodology for reconstruction of wealth levels, following a procedure partly inspired by other studies (Case, Quigley, and Shiller 2005; Skudelny 2009; Slacalek 2009). It is important to note that few studies deal with this perspective in a European context of crisis. Therefore, this study contributes to the field providing a more updated view of the area under discussion. Furthermore, we focus on Eurozone countries, where the institutional framework is more homogeneous (EMU policy framework) than in many other studies (e.g. Bertaut 2002; Case, Quigley, and Shiller 2005; Slacalek 2009; Dreger and Reimers 2011). Furthermore, we include countries with different growth patterns and socioeconomic behaviors that make the analysis become more interesting.

The study of the 10 European economies demonstrates the existence of different behaviors in the period 2000-2010. First, the level of housing wealth is superior to the value of financial wealth, which could be partly explained by the mortgage debts that are transferred to financial wealth undervaluing the estimated value. Second, the growth of housing wealth was superior to the increase of financial wealth in this period due to a significant rise in the housing price (housing bubble).

In general, the results suggest the existence of a positive and significant wealth effect on consumption in all estimated models. Regarding the total impact (considering the multiplying effect of all delays), our results show that an increase (decrease) of 10% in total wealth causes an increase (decrease) of about 1% in the level of consumption throughout time.

In addition, we observed the predominance of financial wealth effect over housing revealing larger consumption sensitivity to changes in the value of financial assets. This finding differs from others that found a larger housing wealth effect (e.g. Barata and Pacheco 2003; Case, Quigley, and Shiller 2005; Dreger and Reimers 2011).

Although the housing assets have constituted a mainstay of consumer expectations and the basis of credit performance in the last decade (Arestis and González 2014), the financial assets present a higher degree of liquidity and measurement facility. On the other hand, the inclusion of unemployment rate shows the coexistence of unemployment effect that has a negative and significant relation on consumption.

Moreover, this study includes an analysis of the interaction of wealth (financial and housing wealth) with the crisis (dummy). This is an important difference from empirical literature, which has mainly aimed at analyzing wealth effects individually and separately. In this respect, we found two apparently contradictory results. On the one hand, we found a positive and significant effect of financial wealth (interacting with crisis) on private consumption. On the other hand, we observed a negative and also significant effect of housing wealth (interacting with crisis) on private consumption. This might be explained by the fact that during the crisis, households were anticipating possible relapses of house prices based on bad expectations.

Finally, we found significant results from the dummy variable (*CRISIS*), which emerges from the deterioration of consumption performance. These results confirm the existence of a significant wealth effect that contributes to a better understanding of the factors behind the consumption behavior before and during the recent financial crisis.

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Appendix

Table 5 Panel Data Estimate (With Year Fixed Effects); Variables in Levels (in Logs); 10 Eurozone Countries; Period 2000-2010; Dependent Variable: Private Consumption Per Capita

	Model I	Model II
Constant	0.267** (0.108)	0.051 (0.145)
Consumption per capita (q-1)	0.906*** (0.021)	0.940*** (0.023)
Disposable income per capita	0.053*** (0.014)	0.042*** (0.011)
Total wealth per capita (q-1)	0.008* (0.005)	------
Financial wealth per capita (q-1)	------	0.015*** (0.004)
Housing wealth per capita (q-1)	------	0.003 (0.005)
Unemployment rate	−0.011*** (0.003)	−0.009*** (0.003)
Income inequality (GINI)	−0.010 (0.009)	−0.021* (0.011)
Interest rate	−0.003* (0.002)	−0.003 (0.002)
Year fixed effects	Yes	Yes
R-squared	0.999	0.999
Within R-squared	0.979	0.981
p-value (*F*-test)	0.000	0.000
Nº observations	332	301

Note: The variables refer to quarterly values and are expressed in logarithms. In both panel regressions, we use clustered standard errors. Robust standard errors are in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).

Table 6 Panel Data Estimate (With Year Fixed Effects); Variables in Changes (t-1 to t); 10 Euro-zone Countries; Period 2000-2010; Dependent Variable: Quarterly Change in the Private Consumption Per Capita

	Model III	Model IV
Constant	0.000 (0.001)	0.000 (0.001)
Quarterly change in the disposable income per capita	0.027* (0.015)	0.018 (0.012)
Quarterly change in the total wealth per capita (q-1)	0.059*** (0.018)	-----
Quarterly change in the financial wealth per capita (q-1)	-----	0.035 (0.028)
Quarterly change in the housing wealth per capita (q-1)	-----	0.090*** (0.030)
Quarterly change in the unemployment rate	−0.056*** (0.017)	−0.051*** (0.015)
Interest rate	0.002 (0.004)	0.005 (0.003)
Year fixed effects	Yes	Yes
R-squared	0.286	0.310
Within R-squared	0.269	0.298
p-value (*F*-test)	0.000	0.000
Durbin-Watson	2.09	2.05
Nº observations	407	377

Note: The quarterly changes refer to logarithmic rate of change. In both panel regressions, we use clustered standard errors. Robust standard errors are in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).

Table 7 Falsification Tests for Panel Data Estimate (Fixed Effects by Country); Variables in Levels (in Logs); 10 Eurozone Countries; Period 2000-2010; Dependent Variable: Private Consumption Per Capita

	Total wealth	Financial and housing wealth
Constant	0.125 (0.078)	0.125 (0.077)
Consumption per capita (q-1)	0.925*** (0.022)	0.926*** (0.022)
Disposable income per capita	0.060*** (0.019)	0.059*** (0.019)
Total wealth per capita (random time)	0.000 (0.000)	-----
Financial wealth per capita (random time)	-----	0.000 (0.000)
Housing wealth per capita (random time)	-----	0.000 (0.000)
Unemployment rate	−0.007 (0.005)	−0.007 (0.005)
Income inequality (GINI)	−0.005 (0.011)	−0.005 (0.011)
Crisis (dummy, 2008-2010)	−0.005*** (0.001)	−0.005*** (0.001)
Interest rate	−0.001* (0.001)	−0.001* (0.001)
R-squared	0.999	0.999
Within R-squared	0.979	0.979
p-value (*F*-test)	0.000	0.000
Nº observations	342	342

Note: The variables refer to quarterly values and are expressed in logarithms. In both panel regressions, we use clustered standard errors. Robust standard errors are in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).

Table 8 Falsification Tests for Panel Data Estimate (Fixed Effects by Country); Variables in Changes (t-1 to t); 10 Eurozone Countries; Period 2000-2010; Dependent Variable: Quarterly Change in the Private Consumption Per Capita

	Total wealth	Financial and housing wealth
Constant	0.003*** (0.001)	0.004*** (0.001)
Quarterly change in the disposable income per capita	0.030* (0.017)	0.029 (0.018)
Quarterly change in the total wealth per capita (random time)	−0.025 (0.034)	-----
Quarterly change in the financial wealth per capita (random time)	-----	0.021 (0.014)
Quarterly change in the housing wealth per capita (random time)	-----	−0.028 (0.032)
Quarterly change in the unemployment rate	−0.054*** (0.016)	−0.055*** (0.015)
Crisis (variable dummy, 2008-2010)	−0.004*** (0.001)	−0.004*** (0.001)
Interest rate	0.001 (0.003)	0.001 (0.003)
R-squared	0.256	0.262
Within R-squared	0.239	0.245
p-value (*F*-test)	0.000	0.000
Durbin-Watson	2.05	2.07
Nº observations	430	430

Note: The quarterly changes refer to logarithmic rate of change. In both panel regressions, we use clustered standard errors. Robust standard errors are in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Source: Authors' own elaboration with data from Eurostat (2014), Global Property Guide (2014) and OECD (2014).